# Prevalence of common mental disorders and associated factors among golf course workers in Johannesburg, South Africa

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**Keywords:** golf courses, caddies, SQR-20, work-related stress, mental wellness

**How to cite this paper:** Tlotleng N, Wilson K, Kootbodien T, Made F, Ntlebi V, Naicker N. Prevalence of common mental disorders and associated factors among golf course workers in Johannesburg, South Africa. Occup Health Southern Afr. 2021; 27(1):10-16.

## ABSTRACT

***Background:*** Poor work environments can lead to poor mental health in workers. Golf course workers are prone to poor health outcomes, including common mental disorders (CMDs) due to work-related stress, poor working conditions, and low socio-economic status.

***Objective:*** To assess the prevalence and factors associated with CMDs among golf course workers in Johannesburg, South Africa.

***Methods:*** In this cross-sectional study, convenience sampling was used to select 375 participants (300 golf caddies and 75 non-caddies) from six golf courses in Johannesburg, South Africa. A sociodemographic questionnaire and the World Health Organization's (WHO's) Self-Reporting Questionnaire (SRQ-20) to assess self-reported CMDs were administered by trained field workers. Logistic regression was used to investigate the association of sociodemographic factors, comorbidities, substance use and work stress-related factors with CMDs.

***Results:*** The prevalence of CMDs was 35.3% in golf caddies and 24.3% in non-caddies. The adjusted odds (AORs) for CMDs among caddies was twice that of non-caddies but the difference was not significant (AOR 2.14, 95% CI 0.89–5.27). The AORs for alcohol use (AOR 3.86; 95% CI 2.19–6.81), intimidation at work (AOR 3.59; 95% CI 2.01–6.43) and existing comorbidities (AOR 2.06; 95% CI 1.05–4.03) were higher in those with CMDs.

***Conclusion:*** A high proportion of golf course workers had self-reported CMDs. This preliminary study suggests that lifestyle factors such as alcohol use, and health- and work-related factors, are associated with CMDs. Further studies are needed to support these findings and provide information to develop intervention strategies, if needed.

## INTRODUCTION

Mental health is emerging as a major public and occupational health problem in many countries. Mental disorders are among the most important causes of morbidity and result in disability in low- and middle-income countries (LMICs).[1] In a systematic review that assessed the global prevalence of common mental disorders (CMDs), 29.2% of the global population was identified as having CMDs at some point in their lifetime.[2] The World Health Organization (WHO) predicted that depression would be the leading cause of disability in developing countries by 2020.[3]

Among South Africans, the 12-month prevalence of CMDs is estimated to be 16.5%, based on a nationally-representative study conducted in 2008.[4] According to the Quarterly Labour Force Survey, approximately 2.5 million people in South Africa work in the informal sector, which is approximately 18% of all workers.[5] Psychosocial stress and depression have been associated with poor health in many workers due to job dissatisfaction and other socio-economic factors that may impact overall wellbeing.[6,7] In 2019, the prevalence of CMDs among a group of informal workers (waste pickers) in South Africa was reported to be 37%, which was much higher than the CMD prevalence of 16.5% reported in the general population of South Africa.[8]

There is insufficient information on the association between work and mental health, given that employment status and work conditions are social determinants of mental health.[9] The few studies that have assessed CMDs among formal and informal workers have reported a high prevalence of CMDs and poorer health outcome in informal workers.[10,11] Characteristics of informal work, such as uncertainties about employment, low income, and absence of work benefits and labour rights, can induce psychological stress.[6] In a study conducted in Brazilian female informal workers, the absence of employee protection was significantly associated with an increased risk of poor mental health.[6] Intimidation and discrimination of informal employees were shown to result in CMDs.[6]

Education, income and employment status have been used as proxy measures of socio-economic status when assessing mental health.[12-14] In a review by Patel and Kleinman (2003) of 11 studies in developing countries, positive associations between low income, lack of education, job insecurity and CMDs were reported.[1] There was also evidence for an association between physical illness and CMDs, where mental health problems and physical illness led to increased poverty.[1,14] Job insecurity is one of the major risk factors for mental health disorders in adults.[6] Unemployment has been shown to result in a significantly increased odds of psychological distress, such as depressive disorders, anxiety, and mental illness.[15]

The golf course industry comprises formal and informal workers, both of whom play important roles in the economic development of the industry. A survey conducted on behalf of the Professional Golfers

Association of SA (PGA) in 2009 estimated that golf contributed R58.4 billion to the South African economy.[16] Golf caddies are informal workers and are defined by the PGA as "workers hired to assist a golfer".[17] Their duties include carrying the golfer's bag, replacing divots of damaged turfs, determining the distance of the golf yard during a golf session, and assisting the golfer with flag marking".[17,18] Caddies also provide advice on playing strategies, regarding shot and club selection.[19] Often, the caddie and golfer develop a 'working' relationship; the caddie provides caddying services as well as psychological support to the golfer during the game.[18-20] Golf course maintenance workers are employed to look after golf turfs. They are formally employed, as are security guards and restaurant workers.

There is limited research on the mental health of formal and informal golf course workers. In this study, we aimed to determine the prevalence of CMDs and associated factors among golf course workers in Johannesburg, South Africa, using the validated validated World Health Organization's (WHO's) Self-Reporting Questionnaire (SQR-20) screening tool.

## METHODS

We conducted a cross–sectional survey amongst formal and informal workers at six golf courses in Johannesburg. There are 44 golf courses in the greater City of Johannesburg. The Johannesburg municipality is divided into seven regions; the five central regions were chosen for this study. Seventeen golf courses that were not in golf estates were chosen from the five central regions. The 17 golf courses were grouped into three affordability categories based on monthly membership fees: expensive, mid-level and affordable. Two golf courses were randomly selected from each affordability category, using a random number generator. A sample size of 375 was calculated, using a confidence level of 95%. The sample was proportionately distributed by worker type: 80% (n = 300) caddies and 20% (n = 75) non-caddies, as each golf course 'employed' more caddies than non-caddies. Study participants were selected using convenience sampling. We selected only male participants, aged 18 years and older, as there are very few female non-caddies employed, and no female caddies. Data collection was conducted over six weeks.

The study team consisted of trained nurses and field workers who conducted interviews following signing of informed consent, in the participant's home language, including, but not limited to, English, Afrikaans, Zulu and Sesotho. Two questionnaires were used. The first was a structured questionnaire used to collect data on education, socio-economic status (type of housing and income level), lifestyle factors, comorbidities and work-related stress (Table 1).

The second questionnaire was the WHO's SQR-20 for common mental disorders[21] (Table 2). This is a low-cost screening instrument for measuring CMDs that has previously been used in health surveys in developing countries.[21,22] It has been used in South African community settings and has also been validated in low-income communities in Johannesburg (Cronbach alpha, $\alpha = 0.84$).[21] The questionnaire contains 20 questions (items) and was used to identify participants with major depression, anxiety and psychosomatic complaints, which are grouped as CMDs. Each question is answered as 'yes' (score = 1) or 'no' (score = 0). The scores of the 20 items were added and a cut-off point of eight was taken to be indicative of symptoms of CMDs, as commonly applied in low-income urban populations.[23]

Ethical approval was obtained from the University of the Witwatersrand Human Research Ethics Committee (clearance certificate number M180661). Permission to conduct the study was obtained from the golf course managements.

**Table 1. Summary of collected data**

| Type | Data |
|---|---|
| Demographic and socio-economic information | Age, education, income level, type of housing |
| Lifestyle factors | Alcohol consumption, smoking status |
| Comorbidities | Diabetes, hypertension, HIV, tuberculosis, stroke |
| Work-related stress | Intimidation at work |

**Table 2. Items in the Self-Reporting Questionnaire (SRQ-20) for common mental disorders***

| Item no. | Question* |
|---|---|
| 1 | Do you often have headaches? |
| 2 | Is your appetite poor? |
| 3 | Do you sleep badly? |
| 4 | Are you easily frightened? |
| 5 | Do your hands shake? |
| 6 | Do you feel nervous, tense or worried? |
| 7 | Is your digestion poor? |
| 8 | Do you have trouble thinking clearly? |
| 9 | Do you feel unhappy? |
| 10 | Do you cry more than usual? |
| 11 | Do you find it difficult to enjoy your daily activities? |
| 12 | Do you find it difficult to make decisions? |
| 13 | Is your daily work suffering? |
| 14 | Are you unable to play a useful part in life? |
| 15 | Have you lost interest in things? |
| 16 | Do you feel that you are a worthless person? |
| 17 | Has the thought of ending your life been on your mind? |
| 18 | Do you feel tired all the time? |
| 19 | Do you have uncomfortable feelings in your stomach? |
| 20 | Are you tired easily? |

**The tool is not designed to provide clinical diagnoses*

*Source: Beusenberg and Orley (1994)* [22]

### Data management

Stata version 15 (StataCorp. 2017. Stata Statistical Software: Release15. College Station, TX: StataCorp LP) was used for data cleaning and analysis. Age was categorised as 22–33, 34–44, 45–55, 56–66 and > 67 years. Education was categorised into primary school or lower, and secondary school or higher. Information on existing comorbidities was collected by asking, "Have you been diagnosed with any of the following: TB, diabetes, hypertension or stroke?" Participants were also asked if they had been tested for HIV, and if they were willing to disclose their results by answering 'yes' for self-reported HIV-positive result, 'no' for self-reported HIV-negative result, or 'undisclosed'. Type of housing was coded as '1' for formal housing or backyard/room dwelling in a formal house, and '2' for informal dwelling or backyard/room in an informal house. Lifestyle factors included current smoking status and alcohol use. To collect information on workplace treatment, participants were asked "Have you ever felt, or do you feel, intimidated by the golf players?"

### Statistical analysis

Categorical variables were summarised as counts and percentages. The Pearson chi-square test was used to assess associations between categorical variables. Median and 25th–75th interquartile ranges (IQRs) were used to describe the ages of participants. Upon checking the distribution, a non-parametric Mann-Whitney rank-sum test was used to describe differences between caddies and non-caddies. Differences were considered statistically significant at the 5% level.

Univariate and multivariable logistic regression analyses were performed to determine correlates of CMDs. Potential confounders and predictor variables that were considered were age, education, housing, income, chronic illness, education, intimidation at work, smoking status, and alcohol use. Bivariate analysis was conducted to assess the association of CMD with individual variables (unadjusted odds ratio and 95% CI). Stepwise backward selection, using a liberal p-value of 0.20, was used to select variables to include in the multivariable model. The effects were presented as odds ratios with 95% CI. A model-building strategy, using the likelihood ratio test, was used to select variables for the final model. Variables that were significant ($p < 0.05$) were retained. Those that were known to be risk factors for CMDs, based on existing literature, but were not statistically significantly associated with CMDs in the bivariate analysis, were also retained in the final model. Goodness of fit of the final model was assessed, using the Hosmer-Lemeshow goodness-of-fit test.

## RESULTS

A total of 375 participants were interviewed in the study. After excluding 52 participants with incomplete information for most of the selected study variables, 323 participants, comprising 74 (22.9%) non-caddies and 249 (77.1%) caddies, were included in the analysis.

A description of the study participants is provided in Table 3. The median age for caddies (49 years, range 42–55 years) was statistically higher than that of non-caddies (39 years, range 31–49 years) ($p < 0.000$). When age was categorised into groups, most of the caddies were in the > 50 years' age group (43.8%); most of the non-caddies were in the younger age groups. Most of the caddies had a secondary school education (70.3%). Education status was available for only four of the non-caddies. Most participants reported living in formal housing (65.3%). The same numbers of non-caddies lived in formal and informal housing. Many participants in both groups reported that they earned less than R4 000 (283 USD) per month (82.7% of caddies and 45.9% of non-caddies).

More caddies than non-caddies reported being intimidated at work (48.9% and 22.9%, respectively). A higher proportion of caddies than non-caddies smoked and/or consumed alcohol ($p < 0.001$). The prevalence of reported CMDs was 35.3% and 24.3% in caddies and non-caddies, respectively.

About a quarter of caddies reported having HIV compared to 13.7% of non-caddies. Among caddies, hypertension (20%) and tuberculosis (19%) were the common chronic diseases reported. Overall, more caddies (24.5%) than non-caddies (18.9%) reported comorbidities.

The unadjusted and adjusted odds ratios from the multivariable logistic regression model are shown in Table 4. In the bivariate analysis, the following variables had p values < 0.20 and were included in the multivariable analysis: type of work, age, housing, smoking, income, chronic diseases and HIV status. Caddies had almost twice the odds of reporting mental disorders than non-caddies (unadjusted OR 1.79, $p = 0.054$). Participants aged 31–40 years had more than double the odds of CMDs than those older than 50 years (unadjusted OR 2.52, $p = 0.004$). Current smokers (unadjusted OR 2.09, $p = 0.004$) and those who consumed alcohol (unadjusted OR 5.01, $p < 0.001$) had increased odds of developing CMDs compared to those who did not use these substances. Those who reported being intimated at work had an almost four-fold odds of CMDs compared to those who did not report intimidation ($p < 0.001$).

The adjusted odds ratio (AOR) for CMDs in caddies was twice that in non-caddies (AOR 2.14), although this was not statistically significant ($p = 0.098$). The odds of CMDs were 2.28 times higher for the group aged ≤ 30 years than for those aged 31–40 years ($p = 0.011$). Informal housing was also associated with CMDs: those living in informal housing had almost twice the odds of CMDs (AOR 1.85, $p = 0.042$) than those living in formal housing. Alcohol use (AOR 3.86, $p < 0.001$) and reported intimidation (AOR 3.59, $p < 0.001$) were both associated with CMDs. Comorbidities also increased the odds of CMDs (AOR 2.06, $p = 0.035$).

## DISCUSSION

The prevalence of CMDs among both caddies and non-caddies was high (35.3% and 24.3%, respectively); the difference was not statistically significant. These findings are similar to those reported in other studies that estimated an increased prevalence of CMDs in informal workers compared to formal workers.[8,10] Ludermir and Lewis (2003) calculated a CMD prevalence of 27% in permanent employees compared to 31% in informal workers.[10] A slightly higher prevalence of CMDs (37.5%) was reported in waste pickers in South Africa.[8] From these studies, prevalence of CMDs appears to be higher among informal than formal workers.

While mental disorders in the general population often arise from socio-economic circumstances, certain types of jobs can increase the risk of developing depression and anxiety.[10,24,25] Ludermir and Lewis (2003) showed that informal work may have an adverse effect on the psychological health of workers, which may increase stress and the risk of mental disorders.[10] Caddies are not formally employed and do not receive regular salaries, thus uncertainties surrounding their work may contribute to poor mental health. Additionally, dissatisfaction with a minimal wage can lead to stress and poor mental health in non-caddies.

A number of socio-economic factors have been reported to be associated with mental disorders.[14,24,26] Low level of education, poor housing, and low household income are the main predictors of CMDs.[12,28] In our study, living in informal housing and having a low education level increased the odds of mental disorders among golf course workers. These socio-economic factors have been found to increase vulnerability of individuals to mood disorders and emotional distress.[28,29] After adjusting for other socio-economic factors, income was shown not to be associated with CMDs. Other studies have also reported that income may not be a predicting factor of CMDs when education is taken into account.[13,24]

The prevalence of alcohol consumption, which significantly increased the odds of reported mental disorders among golf course workers, was 42.4%. This may be related to the work that the study participants did, as job stress can increase substance abuse.[11,30] Our findings were similar to those from other informal worker studies, i.e. mental disorders were common among those who consumed alcohol.[31]

Intimidation at work was associated with CMDs in both types of golf course workers; where the odds of reported CMDs for those who

reported being intimidated at work was almost four times higher than for those who did not report intimidation. Caddies, as informal workers, are at a higher risk of being intimidated as they are not protected by golf course policies. In order to protect their jobs and incomes, caddies may not report incidents of bullying to the golf course managers. Intimidation at work may lead to poor quality of life that, in turn, may result in symptoms of depression and anxiety.[32]

In our study participants, chronic illnesses such as hypertension and diabetes were associated with increased odds of CMDs. The prevalence of comorbid conditions was 23.3%. Living with chronic conditions has been shown to increase the risk of mental illness.[33] Unhealthy lifestyle behaviours, such as smoking and alcohol use, are often viewed as coping mechanisms for stress, particularly in individuals with low socio-economic status.[33] These coping strategies, combined

**Table 3. Socio-demographic characteristics, comorbidities, and CMDs in golf course workers (N = 323)**

| Characteristics | Non-caddies n = 74 | | Caddies n = 249 | | Total | | p value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| **Age (years)** | | | | | | | |
| median (IQR) | 39 (31–49) | | 49 (42–55) | | 46 (39–54) | | < 0.000 |
| **Age-group (years)** | | | | | | | |
| ≤ 30 | 18 | 24.3 | 7 | 2.8 | 25 | 7.7 | < 0.001 |
| 31–40 | 24 | 32.4 | 47 | 18.9 | 71 | 22.0 | |
| 41–50 | 18 | 24.3 | 86 | 34.5 | 104 | 32.2 | |
| > 50 | 14 | 18.9 | 109 | 43.8 | 123 | 38.1 | |
| **Education level** | | | | | | | |
| none | - | - | 4 | 1.6 | 4 | 1.2 | 0.085 |
| primary | 3 | 4.1 | 53 | 21.3 | 56 | 17.3 | |
| secondary | 1 | 1.4 | 175 | 70.3 | 176 | 54.5 | |
| tertiary | - | - | 17 | 6.8 | 17 | 5.3 | |
| missing | 70 | 94.6 | - | - | 70 | 21.7 | |
| **Type of housing** | | | | | | | |
| formal | 37 | 50.0 | 174 | 69.9 | 211 | 65.3 | 0.002 |
| informal | 37 | 50.0 | 75 | 30.1 | 112 | 34.7 | |
| **Income (Rands)** | | | | | | | |
| 0–3999 | 34 | 45.9 | 206 | 82.7 | 240 | 74.3 | 0.809 |
| ≥ 4000 | 40 | 54.1 | 43 | 17.3 | 83 | 25.7 | |
| **Current smoking** | | | | | | | |
| yes | 30 | 40.5 | 158 | 63.5 | 188 | 58.2 | < 0.001 |
| no | 44 | 59.5 | 91 | 36.5 | 135 | 41.8 | |
| **Alcohol use** | | | | | | | |
| yes | 23 | 31.1 | 114 | 45.8 | 137 | 42.4 | 0.025 |
| no | 51 | 68.9 | 135 | 54.2 | 186 | 57.6 | |
| **Intimidated at work** | | | | | | | |
| yes | 17 | 23.0 | 124 | 49.8 | 141 | 43.7 | < 0.001 |
| no | 57 | 77.0 | 115 | 46.2 | 172 | 53.3 | |
| missing | - | - | 10 | 4.0 | 10 | 3.1 | |
| **HIV** | | | | | | | |
| yes | 7 | 9.5 | 49 | 19.7 | 56 | 17.3 | 0.165 |
| no | 41 | 55.4 | 126 | 50.6 | 167 | 51.7 | |
| undisclosed | 3 | 4.1 | 11 | 4.4 | 14 | 4.3 | |
| missing | 23 | 31.1 | 63 | 25.3 | 86 | 26.6 | |
| **Other chronic diseases*** | | | | | | | |
| yes | 14 | 18.9 | 61 | 24.5 | 75 | 23.2 | 0.318 |
| no | 60 | 81.1 | 188 | 75.5 | 248 | 76.8 | |
| **CMDs** | | | | | | | |
| yes | 18 | 24.3 | 88 | 35.3 | 106 | 32.8 | 0.052 |
| no | 56 | 75.7 | 153 | 61.4 | 209 | 64.7 | |
| missing | - | - | 8 | 3.2 | 8 | 2.5 | |

**diabetes, hypertension, stroke, tuberculosis*

with poor living conditions, have been further hypothesised to contribute to the development of physical morbidities and poor mental health.[33,34] Improving the living conditions and working conditions of golf course workers by promoting formal education, and providing coping strategies to deal with stress, may be strategies to improve the mental wellness of these workers. In addition, social support from golf courses management may provide a positive coping mechanism and decrease alcohol abuse.

### Limitations

Symptoms of CMDs and comorbidities were self-reported, which may result in recall bias and information bias, leading to under-reporting of comorbidities and/or over-estimation of the prevalence of CMDs. This might also reduce the strength of the association between CMDs and the reported risk factors. In addition to the small sample size, we used convenience sampling to select study participants. Thus, the results may not be generalisable to other golf course workers in South Africa. Nevertheless, these preliminary results are a basis for future longitudinal studies, using larger sample sizes and optimal sampling frames. Cross-sectional studies comprising larger sample sizes, and conducted in other provinces, are needed to further identify and validate associated risk factors for CMDs in golf course workers, and provide information to develop appropriate intervention strategies, if needed.

We did not investigate work-related risk factors, such as workload and managerial support; these should be considered in future studies. Nonetheless, we used the validated SQR-20 questionnaire to collect data on CMDs, allowing for comparisons of the results with other studies that have assessed CMDs in the workplace.

**Table 4. Factors associated with CMDs in golf course workers**

| Characteristic | n | % | OR | 95% CI | p value | AOR | 95% CI | p value |
|---|---|---|---|---|---|---|---|---|
| **Type of work** | | | | | | | | |
| non-caddies | 74 | 24.3 | 1.00 (ref) | | | 1.00 (ref) | | |
| caddies | 249 | 35.3 | 1.79 | 0.98–3.24 | 0.054 | 2.14 | 0.89–5.27 | 0.098 |
| **Age group (years)** | | | | | | | | |
| ≤ 30 | 25 | 7.7 | 1.84 | 0.75–4.49 | 0.185 | 2.28 | 0.70–7.41 | 0.170 |
| 31–40 | 71 | 22.0 | 2.52 | 1.35–4.69 | 0.004 | 2.71 | 1.25–5.87 | 0.011 |
| 41–50 | 104 | 32.2 | 1.22 | 0.68-2.19 | 0.509 | 0.80 | 0.40–1.61 | 0.541 |
| > 50 | 123 | 38.1 | 1.00 (ref) | | | 1.00 (ref) | | |
| **Education level** | | | | | | | | |
| none | 4 | 1.2 | 1.12 | 0.13–9.94 | 0.916 | | | |
| primary school | 56 | 17.3 | 0.81 | 0.27–2.41 | 0.703 | | | |
| secondary school | 176 | 54.5 | 0.59 | 0.22–1.60 | 0.300 | | | |
| tertiary | 17 | 5.3 | 1.00 (ref) | | | | | |
| **Type of housing** | | | | | | | | |
| formal | 211 | 65.3 | 1.00 (ref) | | | | | |
| informal | 112 | 34.7 | 1.59 | 0.99–2.59 | 0.057 | 1.85 | 1.02–3.35 | 0.042 |
| **Income (Rands)** | | | | | | | | |
| 0–3 999 | 240 | 74.3 | 1.08 | 0.66–1.79 | 0.736 | 0.70 | 0.36–1.36 | 0.297 |
| ≤ 4 000 | 83 | 25.7 | 1.00 (ref) | | | 1.00 (ref) | | |
| **Current smoking** | | | | | | | | |
| no | 188 | 58.2 | 1.00 (ref) | | | 1.00 (ref) | | |
| yes | 135 | 41.8 | 2.09 | 1.27–3.44 | 0.004 | 1.46 | 0.79–2.70 | 0.228 |
| **Alcohol use** | | | | | | | | |
| no | 137 | 42.4 | 1.00 (ref) | | | 1.00 (ref) | | |
| yes | 186 | 57.6 | 5.01 | 3.02–8.31 | < 0.001 | 3.86 | 2.19–6.81 | < 0.001 |
| **Intimidated at work** | | | | | | | | |
| no | 141 | 43.7 | 1.00 (ref) | | | 1.00 (ref) | | |
| yes | 172 | 53.3 | 3.72 | 2.27–6.10 | < 0.001 | 3.59 | 2.01–6.43 | < 0.001 |
| **Self-reported medical history** | | | | | | | | |
| **HIV** | | | | | | | | |
| yes | 56 | 17.3 | 1.88 | 0.52–6.71 | 0.334 | | | |
| no | 167 | 51.7 | 1.37 | 0.41–4.54 | 0.611 | | | |
| undisclosed | 14 | 4.3 | 1.00 (ref) | | | | | |
| **Other chronic diseases** | | | | | | | | |
| no | 75 | 23.2 | 1.00 (ref) | | | 1.00 (ref) | | |
| yes | 248 | 76.8 | 1.14 | 0.67–1.97 | 0.622 | 2.06 | 1.05–4.03 | 0.035* |

** OR: odds ratio; AOR: adjusted odds ratio; CI: confidence interval*

## CONCLUSION

To our knowledge, this is the first study to assess symptoms of CMDs in golf course workers. The prevalence of CMDs was higher among informal than formal golf course workers. Work-related stress, substance abuse and comorbidities are associated with poor mental health in golf course workers. Job insecurity may have an impact on the psychological health of informal workers. Further studies are needed to support these findings and provide information to develop intervention strategies, if needed.

## KEY MESSAGES

1. Golf course workers report experiencing CMDs that could be associated with socio-economic factors, such as poor living conditions and alcohol use.
2. Most golf course workers earn less than the minimum wage.
3. Golf course workers would benefit from health and wellness programmes.

## DECLARATION

The authors declare that this is their own work; all the sources used in this paper have been duly acknowledged and there are no conflicts of interest.

## FUNDING

We received no funding for this research.

## AUTHOR CONTRIBUTIONS

Conception and design of the study: NT, TK, KW, FM, VN, NN
Data acquisition: NT, TK, KW, FM, VN, NN
Data analysis: NT, KW
Interpretation of the data: NT
Drafting of the paper: NT
Critical revision of the paper: NT, TK, KW, FM, VN, NN
Accountability for all aspects of the work: NT, TK, KW, FM, VN, NN

## ACKNOWLEDGMENTS

We wish to thank the management of all golf clubs and workers who participated in the study. We would also like to thank the field workers for conducting the participants' interviews.

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